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THE INSTITUTION OF PRODUCTION ENGINEERS

PROCEEDINGS.—SESSION 1925-26

The Official Journal of the Institution of Production Engineers
Published Monthly.

Contributions from members on matters of general interest are invited, and if suitable will be paid for at the rate of 10s. 6d. per page. Articles may take the form of descriptions of new plant or tools, interesting workshop methods and production problems, or shop organisation systems. All communications, other than those relating to advertisements, should be addressed to the Hon. Editor, Mr. E. D. Ball, 20, Lusnington Road, Harlesden, N.W.10.

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EDITORIAL.

IN this, the first issue of our Institution Journal, we look back to four years of good work well done. Much has occurred since the first meeting of those pioneers who formed the nucleus of the Institution, but the record is one of steady progress. Our finance, our membership, and the quality of our papers are all sound—in short, we have now a past, or tradition.

This little Journal owes its inception to the unfortunate loss of our official organ. Since that journal ceased publication we have been faced with a difficult situation, and of that situation this Institution Journal is the outcome. Its success will depend very much on the assistance given by members, and in future the Institution Journal alone must be looked to for the publication of our Papers and Notices. Members should therefore do all in their power to ensure the success of this, their own Official Organ.

Members are invited to send in items of news, contributions, etc., and to circulate the Paper amongst their shop associates. The earnest hope of the Institution Council is that members generally will do all in their power to forward this new project. It must also be borne in mind that, forming as it does the only record of our Papers and Proceedings, care should be taken of each issue so that these may be bound at the year's end. As far as possible, the published matter will be so arranged that the Papers can be bound alone if desired. Some members, however, may prefer to bind the entire issues as they stand, but in any event they are asked

to retain them carefully for binding at the completion of the session.

As far as is practicable, bearing in mind the price factor, the Journal will be well printed on good paper and made worthy and representative of the Institution. It must, however, be borne in mind that, as in our occupation as production engineers, price is a controlling factor, the size, character, quality, and illustrations will be all governed in this way.

It is hoped that the Journal will prove successful. The Institution of Production Engineers is undoubtedly doing invaluable national work in the engineering industry. The present era is one of intense commercial competition, not only amongst British firms, but more particularly from abroad. It is difficult to know quite what will be the upshot in certain directions, and there are many advocates each with a different solution of the problem.

In some industries Protection is looked to, and there is little doubt that this does confer special benefits upon an industry. It must, however, be borne in mind that opinions are widely divergent as to its broad general effect on the country's trade and upon other industries, so that Protection, therefore, necessarily involves an unstable situation. That is to say, while an industry may enjoy the assistance of a tariff for a certain period, political changes may at any moment remove that advantage, leaving the industry to fight for itself.

This instability is ever present, so that it must therefore be to the production engineer that the engineering trades, at any rate, will look for assistance in fighting competition Price and price alone will govern the commercial supremacy of British goods, and commercial success for our products can only be secured by the unremitting efforts of the production engineer.

Our work, then, is a great one, and in launching this new venture to assist and advance it we confidently look to all members to co-operate to the utmost.

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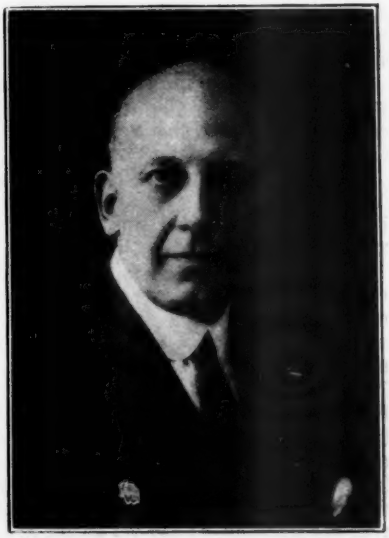
PRESIDENTIAL ADDRESS.

Delivered at the Annual General Meeting, October 17th, by R. H. Hutchinson, Esq.

GENTLEMEN,—On rising to address you for the first time as your President, and before pursuing the subject of my address, I find myself compelled to refer to a matter which I know must be fraught with sadness for many of us—that is, the loss of our very dear friend, Max Lawrence.

It is with the greatest respect to his memory that I drop the conventional "Mr.," for to all those who worked alongside of him or under him he was always just plain "Max Lawrence," and what could be more indicative of his greatness and the affection and esteem in which he was always held? Gentlemen, the loss we have sustained is a grievous one. Not only as an Institution have we lost one of our keenest supporters, whose energy and work in our interests was largely responsible for bringing us through the early and most difficult years of our existence, but as individuals most of us have lost a friend—a friend who could always be relied upon in emergency, always courteous, always kind, always ready to give helpful advice, thinking ever of the welfare of others; an idealist, perhaps, not always understood, but always revered and respected. Thus will he be missed and thus mourned.



Mr. R. H. Hutchinson. President, 1925-26.

Of the work done in our interests by our past President, Mr. Fisher, and his predecessor, Mr. Scaife, it is difficult to speak too highly. Let it suffice that my every endeavour shall be to do as well. If I succeed, then I shall leave this chair at the end of my year of office with no vain regrets.

Now every institution is, or should be, created to fulfil a definite purpose and with certain objects in view. In some cases those objects are obscure and ill-defined; in others they stand out quite distinctly, and without doubt the degree of success, or otherwise, attained must of necessity depend upon, firstly, the clearness with which they are defined, and, secondly, their utility, not only to the members, but to the community as a whole, for it should be generally accepted that no institution or body whose objects are purely insular can ever meet with any considerable measure of success or grow to any great size. This being the case, let us pause for a moment to consider our own objects and in what direction they can best be applied to be of utility both to ourselves and to the community.

Towards the end of the last century engineers were divided into three groups only: Civil, mechanical, and electrical;

Civil engineers, handling the construction of roads, railways, dams for the purpose of large irrigation schemes, land reclamation and the like;

Mechanical engineers, building bridges, ships, locomotive or stationary engines, etc.;

Electrical engineers, who, although necessarily having a fairly wide knowledge of the fundamental principles of mechanical engineering, add to this a wider knowledge of the intricacies of electricity and its application.

Outside these three main classes, all those engaged on production of any kind were merely termed manufacturers, no matter if the product handled was of a mechanical nature or purely textile.

In those days there was just cause for this; for whereas the work of the engineer was based upon the recognised branches of science and theory, and very great attention was paid to design, it must be admitted that very little scientific knowledge was brought to bear upon actual production and the methods employed therein. No blame attaches to the producers of that period for this. On the contrary, how often has one to admire the ingenuity displayed by them in the absence of the knowledge that is ours to-day, for at that time the great science of mechanical production was but in its birth. To-day this science, born of the ever-growing demand for mechanical contrivances, is quite as intricate, and at the same time far reaching, as any yet known to mankind. The phenomena met with compare with those of the other sciences, and similar methods of research have to be employed in solving them.

Chemistry, metallurgy and metrology play a big part in the work of mechanical production to-day, and the engineer responsible for it has to be ever on the alert in order to take full advantage of the development which is all the time being made. New alloy steels requiring new methods of working; new tool steels capable of heavier duty; new types of machine tools designed to give more output with greater accuracy and new methods of measuring making possible and economical the adoption of closer manufacturing limits, are but a few of the many lines of advancement, all of which are inherently wrapped up in each other.

This, therefore, brings us to the first object of the Institution of Production Engineers.

It is to bring together for mutual discussion and advancement the representatives and specialists in all the essential phases of the science of mechanical production. And this is where we differ from the numerous Institutions who represent only their own particular branch of the industry, and the reason why we are justified in our hope of ultimately ranking with the Institutions of the Civil, Mechanical, and Electrical Engineers.

No one can for a moment question the usefulness of the many other institutions referred to, but it must be abundantly clear to everyone that there is a very real and ever-growing need for an institution affording an opportunity for a constant and comprehensive exchange of ideas and free and open discussion of all matters vitally affecting the manufacture of every form of mechanical contrivance, for, whatever it is, the underlying principles governing the production of its parts will be practically identical.

Now time was when as a nation we led the world in every form of engineering, but to-day we have to work hard to hold our own with other countries, and this is where our work can be of use to the community, for it is only by a constant interchange of knowledge between every section of the engineering industry and an incessant sifting of the results obtained to the fullest advantage of the industry as a whole that we can hope to maintain our position among other nations.

As an example of this may be cited those branches of our profession dealing with the manufacture of small tools and also machine tools. It is nothing short of a scandal and a crying shame in these days of unemployment and half empty factories in our own land that we should spend one single penny on the import of these goods. In spite of which we find hundreds and hundreds of thousands of pounds annually going into the pockets of foreign manufacturers.

There was never a small tool or measuring instrument, never a machine tool built, no matter of what type, in any works on the Continent of Europe or in America that could not to-day

be produced just as well and just as cheaply in our home factories.

And yet we continue to buy these things from abroad. And why? The answer is that, although we are quite able to produce them just as well in this country, in a great many cases we do not do so, and for the sole reason that the manufacturers are not in sufficiently close touch with the actual users of their products.

This may savour of exaggeration, but unfortunately it is only too true, and, gentlemen, I am very sure of my subject and speak from actual experience, but I can also tell you this, that I have never yet known a British firm fail to come up to the scratch when the real requirements of the case are put fully and truly before them. This fact alone is sufficient to prove the truth of this contention, for if they are able to meet the requirements after weeks and sometimes months of negotiations, then they could just as easily have supplied the right thing in the first instance had they been in closer touch with the user.

This does not refer to any special tools or purpose-built machines, but to perfectly standard and everyday products which continue to be imported in totally unnecessarily large quantities.

And what is the explanation? Simply this—that whereas the foreign manufacturers are all the time in touch with the very latest requirements in every phase of accurate production through their engineering institutions, the British manufacturer has heretofore had to depend almost entirely upon the information supplied by his selling organisation. For it is to be regretted how many Britishers, though thoroughly patriotic in all else, quite lose sight of the fact when placing an order that it is their duty to their country to place that order in their home market, and that no time or trouble is misspent if it results in helping a fellow manufacturer to improve his commodity, and so resist foreign competition.

Gentlemen, the era is now closed when manufacturers could lock themselves up with their jealously guarded secrets; to attempt to do that to-day simply spells disaster. We have all got to come forward, and by free and open discussion give each other of our best, and so to make our plans for advancing with a united front in our fight to regain the supremacy that was ours, and what better means can there be for such discussion than the Institution of Production Engineers?

There is another and equally potent reason why in many cases our home products are unable to compete favourably with imported articles, and that is, want of attention to detail. Compare for one moment a German-made mechanical toy with one made in this country. The one, a thoroughly well-made and well-finished article, the other, at perhaps two or three times the price, only too often a crude, unfinished piece of work. The comparison is not a pleasing one, but nevertheless true. And where does the

difference come in? Simply in the attention paid to detail in design and manufacture.

You may say "Yes, but what have toys to do with production engineers?" A very great deal, for, just as the mind of a growing child can be influenced by the small playthings which he prizes, so can the mental outlook of a growing industry be influenced by example and result. It matters not whether it be toys, machine tools, motor cars or locomotives; throughout, the matter of attention to detail is of prime importance.

There is a motor car being produced in this country to-day in very large quantities, a splendid monument to the science of the production engineer, and yet the tool space provided under the front seat will not accommodate, by a couple of inches, the tyre pump or jack handle, and the only place in the car for these is under the feet of the back passengers.

A few weeks ago I was examining a drilling machine designed by one of our home manufacturers to compete with a type so far exclusively supplied by an American firm. The jack screw is placed in line with the drill spindle instead of a few inches behind, rendering the machine unsuitable for high-class work on holes of any depth requiring piloted drills and reamers. This same machine is provided with a depth indicator of really excellent proportions, and yet so arranged that it cannot be seen by the operator when standing in front of his machine and within reach of his hand wheel. The simple expedient of marking the scale on the bevelled edge of the indicator would have righted this.

My attention was recently drawn to a plain grinder built in this country, a tool possessing many splendid qualities. It was desired to make a slight adjustment to the wheel head bearing, when it was found that the nuts provided for this purpose had upwards of $\frac{1}{16}$ of an inch of play on the threads, in fact, much care had to be exercised in removing one of them not to get it cross-threaded. In another machine of similar type, although indicating in most of the essentials of design plenty of thought and care, no precautions are taken to prevent grinding grit from working into the moving parts of the feed mechanism.

A couple of weeks ago I attended a lecture given by a representative of a large firm of steel makers, marketing a brand of steel possessing properties which render it peculiarly difficult to machine. Now the firm in question claim to spend quite a deal of money in experimenting in the machining of this steel for the benefit of their customers. The lecture, however, only dealt with the most elementary operations, planing, flat milling, plain turning, and drilling. All the finer operations, such as reaming, screwing, tapping, or broaching were severely left alone, and when questioned, the lecturer had to confess that they had little or no information on the subject. In other words, they had completely

failed to appreciate or become versed in the real difficulties with which their customers, whom they honestly desired to help, were faced.

It would be possible to spend the whole evening giving similar examples of want of attention to detail. In every hour of every day, wherever one looks, it is evidenced.

Individually and collectively we engineers have got to get down to it; let us start now before it is too late. Make "Attention to Detail" your slogan and a point of your daily life. Continually preach the doctrine to others. Attend regularly the meetings of our Institution and bring your friends with you as often as you please.

Enter freely and fearlessly into our discussions. Make constant notes of any instances which come under your notice, and come and talk about them in our debates. Every point so raised will be duly noted and tabulated, and your council will see to it that the valuable information which is bound to result from such a course is regularly communicated to the branches of our industry affected.

This brings us to the next vital point to be considered, viz., efficiency in production. Now in every conceivable kind of production there prevail three ruling factors. They are: Quality, quantity, and cost—all quite interdependent.

Quality has to be improved without detriment to quantity or cost—quantity has to be increased without detriment to cost or quality—and cost has to be reduced without detriment to quality or quantity, and so we arrive at the cycle in which production perpetually revolves. Improved quality, increased quantity, and reduced costs.

The part that we as an Institution can play in the matter of quality having been indicated, we will pass on to the other two factors.

The terms quantity and cost as applied to production, and mass production in particular, are, or should be, very nearly synonymous, though not quite, for both must be dependent upon man-hour or machine-hour output. It is obvious that if a reduction in the cost of labour or material or both is accompanied by a corresponding increase in capital involved that no actual reduction takes place. Conversely, a reduction in cost can be realised, though labour and material costs remain stationary, by a reduction in the amount of capital involved. The cost of non-productive labour and supervision can be capitalised and be treated as involved capital.

To reduce labour costs means higher man-hour output. To reduce involved capital means higher machine-hour output with a reduction in the proportionate value of stocks and work in progress by carefully balanced operations. In other words, a quicker

turnover. It is impossible, therefore, to lay too much stress upon the importance of these questions of man-hour and machine-hour output.

In the matter of man-hour output, working conditions, wages, stores and shop organisation, motion study, fatigue factor, and supervision are the main features. Under the heading of machine-hour output come shop layout, processing, rate-fixing, jig and tool design and upkeep, machine tool maintenance and progress. In every one of these matters there is scope for those in charge to eliminate waste.

It is most regrettable that to-day many of our workers suffer with the idea that it is their bounden duty to restrict output. Countless thousands of them have this idea firmly rooted in their minds and live up to it. As many others know and understand the fallacy of it, but dare not increase their output for fear of the gibes and sneers of their less enlightened comrades. Possibly we cannot put the whole of the blame on them. Perhaps many of us, were we situated as they, would think likewise.

At street corners, in the parks, and by literature, are they constantly having the doctrine preached to them; and the arguments used—arguments of the most dangerous kind, that ring true in all but the lying hypothesis upon which they are based—sound feasible enough to them. Rather should we blame those whose apathy is too great to go out of their way to refute it.

Possibly also a great deal of blame rests upon those employers who have in the past stifled honest effort by adopting the practice of rate-cutting. Even to-day there are employers who still hold the belief that it pays—a belief every bit as fallacious as that of the poor ignorant man who believes that it pays to keep his output down.

Now the opportunity rests with the production engineer more than anyone to combat this evil. In the first place he is in daily contact with the workpeople, and by example and fair dealing can gain their confidence. Secondly, he can so organise his shop, lay out his work, design his jigs and tools, and fix his times, that it becomes ever increasingly difficult for the workers deliberately to curtail their output.

Here, then, in regard to these questions of quantity and cost, are further matters of vital importance to the industry as a whole, demanding an equally wide and free interchange of ideas between those responsible in every branch of mechanical production.

There is just one point which time does not permit me to enlarge upon, but without passing reference to which my subject would not be complete. I refer to inspection. Many firms have already appreciated, and are already benefiting by the immense value of a well-organised inspection department, but unfortunately

there are more to whom up-to-date inspection methods are practically unknown.

Then again how many engineers holding quite responsible jobs in the shops are prone to look upon the inspector as a kind of policeman and quite an unnecessary nuisance. Unfortunately, some inspectors are inclined to look upon themselves as very superior persons, and are by their manner partly responsible for this. But whatever the mental attitude of the man in the shop to-day, the time is coming when it will be realised that a strong, impartial, and efficient inspection department is not only beneficial but an absolutely essential part of efficient production.

And now, gentlemen, I have, I trust, given you some idea of the principal of our objects, viz., the provision of a comprehensive Institution for this comparatively new profession of scientific mechanical production, to co-ordinate the many branches of the engineering industry so vitally dependent upon it. This is not only to enable us the better to supply our own needs, but, what is much more important, to assist us to compete successfully in all the markets of the world.

OBITUARY.

The late Mr. Max R. Lawrence.

IT is with the greatest regret that we have to include in this, the first issue of our journal, an obituary notice of so distinguished a member as our late President, Mr. Max R. Lawrence. Although for some time he had been hampered by uncertain health, his death at the early age of 53 came as a great shock to his many friends.

Mr. Lawrence received his first engineering training at the School of Electricity and Mines in Hanover Square, taking a First Class Certificate in electricity, telegraphy and telephony, after which he served his time as a pupil in the Midland Railway Locomotive Works at Derby. At the age of 21 he was appointed Assistant Loco Superintendent at the Manchester Central Station (Midland Railway). He left this position to work first at Stanningley Iron Works, and later at Joshua Buckton's under the late Hartley Wicksteed.

His decision to enter the sphere of motor engineering was taken in the early days of the industry, and he was successively works manager of the Lanchester Motor Co. and of Wolseley Motors, first at Crayford, and then at the much larger factory in Birming-

ham. In October, 1911, he started business for himself, taking over the Wolseley agency for the North-West of England, in conjunction with consulting work in connection with motor ploughs, etc. Unfortunately he was obliged to give up this business at great financial loss soon after the outbreak of the war, and he returned to works management and held important administrative positions. Just before the conclusion of the war Mr. Lawrence had a severe breakdown in health, but after six months' rest he was able to take up consulting work in London, partly for Messrs. Burton Griffiths and partly on his own account, until 1922, when he became works manager of the Sterling Telephone & Electric Co., Ltd., at Dagenham. This post he held until his sudden death after two months' illness on August 29th, 1925.

He was a man of unusually wide engineering experience, and extremely interested in design and detail of construction and wonderfully keen about everything that came under his notice.

He designed trough lubrication on motor cars and many machine tools and jigs for the manufacture of automobile parts. He was largely responsible for the design of the Wyles Motor Plough and for several types of franking machines.

He was a good organiser and a pioneer of canteen and club work in connection with factory employees. He and his wife did yeoman work in that direction in Birmingham and the North during the War, even before the Central Control Board and Welfare Departments of the Ministry of Munitions were formed.

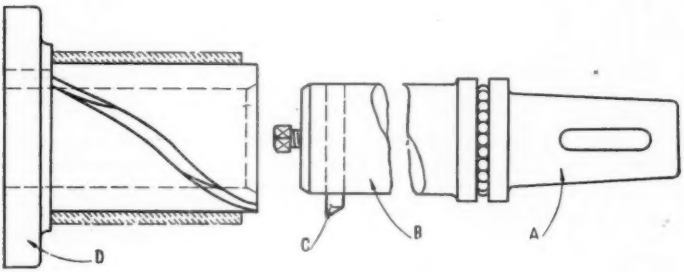
In addition to the office of first President of the Institution of Production Engineers, which he filled with distinction, he was an original member and past Vice-President of the Royal Automobile Club, a member of the Institution of Mechanical Engineers and of the Institution of Automobile Engineers. He had many friends in all stations of life, and it is perhaps interesting to mention that he was the original of the character of "Kysh" in Rudyard Kipling's story "Steam Tactics" in Traffics and Discoveries.

It is impossible to conclude a survey of Mr. Lawrence's career without mentioning the debt which we, as an Institution, will always owe to his initiative and enterprise in the earliest days. Our present success is due in no small measure to his energy and wise guidance in the early critical period. Members will join with the Council in expressing their deep sympathy with the relatives and their sense of personal loss.

A USEFUL TOOL FOR CUTTING SPIRAL OIL GROOVES.

THE tool shown in the illustration has been found to be both cheap and effective for cutting either straight or spiral oil grooves in bushes, and it has the advantage of requiring very little tackle. It has been designed so that the job can be put on any idle press when machines and broaches are fully occupied.

Referring to the illustration, the adaptor A is made to suit the ram of the press, and is provided with a spigot to take the toolholder B. This is free to rotate on the adaptor, preferably on a ball race as shown, and is drilled at the bottom to take an ordinary round-sectioned cutting tool C. Another adaptor D is bored to suit the toolholder, the outside diameter of this adaptor being turned to take the work.



A straight or spiral slot is cut through the adaptor according to the profile which it is required to produce in the bush, and the tool is set so that it strikes the slot when the ram of the press descends; it will then follow the slot and produce a good clean oil groove. In the case of bushes in which the oil hole is drilled first, it is a simple matter to provide a spigot or pin which will locate the bush in the correct relationship to the drilled hole. A clamp may also be added to hold the bush in position, the method of arranging the clamp depending, of course, upon whether the bush is plain or flanged.

A further advantage with this method is that the toolholder can be designed to suit a large number of different-sized bushes, the only requirement being a separate spigot for each different size.

J. W. BROADBENT (Associate Member).

THE ANNUAL GENERAL MEETING AND DINNER.

THE Annual General Meeting and the Second Annual Dinner were held at the Engineers' Club, Coventry Street, London, on Saturday, October 17th.

MR. A. BUTLER (Vice-President) presided at the opening of the Annual Meeting in the temporary absence of the President, Mr. W. L. Fisher.

The minutes of the last general meeting were read and confirmed.

THE CHAIRMAN said that, before introducing the new President, he would like to say a few words on the work the Institution had done during the past year. The Employment Bureau had been started in a small way with the object of putting members in touch with vacant positions, and the Council was most anxious that the work of this Bureau should be extended as far as possible. Many members were "in the know" before news as to positions that were coming along was circulated through the usual channels, and he appealed to members to advise the Secretary as early as possible of any vacancies they knew of in this way. The Secretary would then take steps to bring them before the members generally, so that those contemplating making a change or who happened to be out of employment could make their applications in good time. In this and in other matters there was need for greater co-operation among the members, and he expressed the hope that everyone would do his best in that direction, in the knowledge that the Council would do its part. For instance, he urged the members to turn up in greater numbers and in better time at the ordinary meetings, in order to have the opportunity of being introduced to people whom they did not know. This would be found to be an advantage to everybody concerned, and he suggested that it would be a good plan if members would make a point of being at the meeting half an hour or so before the time announced for starting. He was pleased to say that the membership was steadily increasing, and they would all agree that it was better that it should increase steadily with the right type of member, rather than it should go up with a rush and then die away.

The Council, after careful consideration, had decided to publish its own official Journal; arrangements were being made to

include advertisements in it, and he asked all those members who might have influence in this direction to do their best in the interests of the official Journal in this respect. Mr. Davey had been appointed advertising manager, and would be very pleased to give the necessary information. It had also been arranged to publish articles from members, and a scale of payment had been arranged, which, he thought, would be found very satisfactory. In addition, of course, the papers and discussions at ordinary meetings would be published in the official Journal. It was to the general interest to make the new official Journal a success, and he had no doubt that it would be a success. It was not by any means an experiment, nor was it risking anything in the ordinary way, because if they did not publish a Journal of their own it would be necessary to have the papers and discussions printed somewhere, and the Council was very strongly of the opinion, after having gone carefully into it, that the cheapest and best way was to publish their own Proceedings in the form of a monthly Journal, which could be bound together in a volume at the end of the year. It was only necessary for the members to do quite a small percentage of the work involved, the Council and the Secretary doing the bulk, but he appealed to everyone to do their best to assist.

MR. BUTLER then introduced Mr. R. H. Hutchinson, the new President, who delivered his Presidential Address (see page 3).

Following the address, MR. A. BUTLER proposed a hearty vote of thanks to the retiring President, Mr. W. L. Fisher, for the work he had done for the Institution, not only during the past year, but in the previous years ever since the Institution was started. Mr. Fisher, he said, had done a great deal of work in a quiet manner, which was only known to the Council, and he could assure the members that the success of the Institution had been due in a large measure to the work that Mr. Fisher had done.

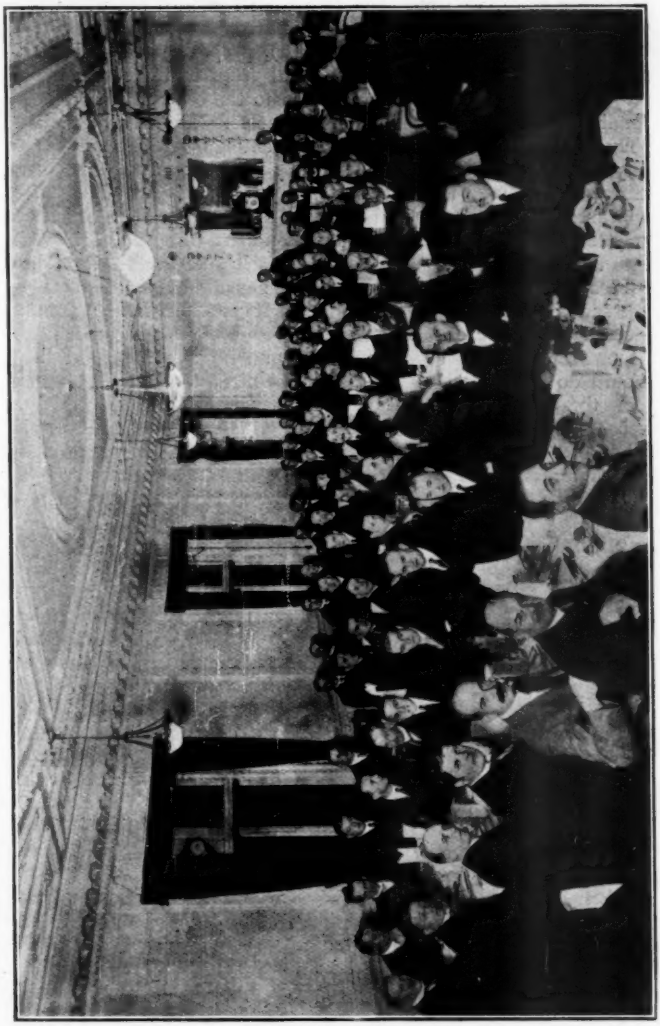
The vote of thanks was seconded and carried with acclamation.

MR. FISHER, in acknowledging the vote of thanks, said he was sure that Mr. Hutchinson would make a far better President than he himself had, because he had far more experience and ability in production methods, and under Mr. Hutchinson's Presidency the Institution was bound to have a successful year.

The Second Annual Dinner.

MR. R. H. HUTCHINSON presided at the Dinner which followed, at which a party of 100 sat down.

After the Toast of "The King" had been duly honoured, THE PRESIDENT mentioned that he had received telegrams from Mr. J. D. Siddeley—who regretted his inability to attend through



pressure of other engagements—and from Mr. Davey, their late Hon. Secretary, who unfortunately was ill in bed, but who wrote wishing the Institution a successful year.

Mr. W. L. Fisher (Past-President), proposing "The Institution," said that after the Presidential Address there was really very little for him to say with regard to the objects of and need for the Institution of Production Engineers. The Institution was going ahead, and the past year had been one of progress. Happily, everything seemed to be in a very sound condition; membership was growing, the finances were good, and the Institution appeared to have an assured future. At the same time, it rested very largely with the members as to the degree of success achieved. One thing necessary was still further to increase the membership—because, although the membership was good at the present time, it was still necessary to grow—whilst it was also in the general interest that there should be larger attendances at the meetings. At present members were very keen, and he suggested that they should do all in their power to get their friends in the shops to join the Institution. After all, although production engineers were sometimes regarded as unimportant people, and the people above them got a good deal, if not all, of the glory, yet production engineers had really to do the work, and he felt that for this, if for no other reason, the Institution was bound to continue to grow. In a way they had reached a critical stage in the history of the Institution, because the membership was just sufficiently good for the members and the Council to be tempted to sit down and say they were satisfied with the position. That, however, must be avoided, and they must all put forth further endeavours in order to make still more progress. In conclusion, Mr. Fisher expressed his pleasure at such a large attendance, and looked forward to similarly large attendances at the ordinary meetings of the Institution.

Mr. J. D. Scaife responded to the toast, and said that, unfortunately, he had not had much time to give to the affairs of the Institution during the past year, and, therefore, was afraid he did not know very much of what had been done. Nevertheless, the Institution still had his interest, and he was as enthusiastic as ever for its welfare. In replying to such a toast as this he felt it incumbent upon him to mention, first of all, the loss the Institution had sustained in the death of Mr. Max Lawrence, who was the first President of the Institution, and had done so much good work for it. They had undoubtedly lost a good man in Mr. Max Lawrence, and everyone regretted sincerely to hear of his death.

Referring to the state of trade in England, Mr. Scaife said that various reasons were given for this. Some people blamed the workers and said that they did not work hard enough and that wages were too high, and various other reasons were put

forward. As a matter of fact, no one reason was responsible for the state of trade in England at the present time. Personally, however, he was inclined to think that, when all the circumstances were weighed, the reason lay largely with themselves, i.e., the production engineers and the people over them. He believed the want of efficiency in our industries in this country was the principal reason for the present bad state of trade. In the course of his business he went into the factories of various firms and had the opportunity of sizing up the organisation of them, and he could not help coming to the conclusion that the state of trade with these firms was related to the effort and the skill which was put into the businesses. When he saw the principals of firms with long faces and complaining that trade was bad, it was usually to be found that the principals themselves were largely at fault. This led him to believe that England was by no means dead from the engineering point of view. There was life in the old dog yet if we would only utilise the opportunities that we have. Without going into the matter in detail, he thought that scientific organisation and effort, together with hard work, leading to greater efficiency, was the main thing. At the same time, it was not to be suggested that the whole of the trouble was due to the production engineer, because there were many who would like to go much farther in the matter of efficiency if they had the chance, but very often it was impossible to get the necessary money from those above them in order to make the businesses more efficient. The point he wished to emphasise, however, was that he did not think the main part of the trouble was connected with wages. The wage element was a very small part of the total cost of manufacture. In his own estimates, at any rate, it was only a very small ratio of the total cost, and a very small improvement in internal organisation would make up for a fairly large increase in wages. The problems concerned with the workmen resolved themselves into giving a square deal and reasonably good wages and expecting a fair return, and personally he had never had any difficulty in getting that.

He was exceedingly pleased that Mr. Hutchinson had been elected President, because, knowing him as he did, he should be disappointed if the Institution did not achieve great things under his leadership. He was the right man in the right place, both for the Institution and for the firm which had, if he might say so, the privilege of employing him.

Mr. G. Hales proposed "Our Guests," and said that the members of the Institution were gratified and honoured with the presence at the Dinner of so many gentlemen who were eminent in the engineering world. The President, in his Address, had referred to the objects of the Institution, and the fact that engineers who played a very important part in production engineering had

associated themselves with the Institution by being present at the Dinner would be an incentive for greater effort on the part of the Institution in the future. Incidentally, he expressed the hope that many of those who were guests of the Institution would soon become members and assist in the development of the work of the Institution. One of the most important objects of the Institution was to improve the status of engineering as applied to production, whilst another was to facilitate the exchange of ideas relating to improvements in the methods and practice of engineering generally, and these objects could only be fully attained by everyone concerned in any way with production engineering becoming members of the Institution.

MR. G. PATE, who replied to the toast, after regretting the absence of Mr. J. D. Siddeley—who was originally intended to reply to the toast—congratulated the Institution upon having Mr. Hutchinson for its President this year. Than Mr. Hutchinson he could not think of anyone more likely to infuse life and spirit into the Institution. He could not think of any man who would be prepared to give more time and more thought to the work of the Institution and to further its interests in every way. He had had the privilege of knowing Mr. Hutchinson for a good many years, and he would say to the members of the Institution that if they wanted a man to work, or if they wanted a man to play, they could find none better than the President they had elected. He had always found Mr. Hutchinson diligent in business and fervent in spirit, and he played whatsoever game he set out to play.

They had heard from Mr. Hutchinson an Address on the objects of the Institution and all the things which might be hoped for the Institution. He would like to tell all the members that in all these things Mr. Hutchinson practised what he preached, so that from that point of view the Institution should look forward to a very interesting and very helpful year. Continuing, Mr. Pate said that the difficulties with which the modern progressive production engineer has to contend were very varied, for the field in which the production engineer worked was a very wide one. It could be taken for granted, by the presence of so many at the dinner, that it was realised not only how much more numerous were the difficulties than they used to be, not only how much more was expected from those responsible for production, but also that they were all determined to pool their individual experiences for the benefit of all. That was a most commendable object, but doubtless it would be realised that varied experiences would be looked at from many different points of view and perspectives. This point had already been mentioned by Mr. Hales, but it would stand a little stressing. Some of them might be engaged in an industry where the difficulty was to produce the maximum quantity at the lowest acceptable standard. The majority were

doubtless engaged in work where the two generally conflicting requirements, viz., quantity and quality, had to be compromised, and some few were doubtless engaged in an industry where quality always came first and quantity was of secondary importance. Therefore, they would individually regard the experience of others each from his own standpoint, and, just as the combination of all shades of colour, when merged, formed the white light of day, so would all these different opinions, when freely expressed, help to make difficulties appreciated and understood in their true relation. Further, we were all helping to sharpen tools with which the next generation would work, just as our fathers sharpened the tools for us. The older men to-day had had a great deal of experience, and if they would, this experience could be exchanged with men of like maturity. It would, however, be available also to the younger men, who, having heard of methods of overcoming particular difficulties would be enthused and encouraged to tackle their own difficulties. To these younger men the training and experience arising from discussions at the Institution would be invaluable. They would realise afresh the foundation of truth in the saying " Difficulties are made to be overcome." If inclined to be timid and faint-hearted, they would gradually join the select band of production engineers who say " It's a bit of a snorter, this problem, but I believe it can be done, and I'm going to do it." There were too many production engineers, as Mr. Scaife had already indicated, who were inclined to say that a thing was too difficult or that it could not be done, or else that it could not be done at the price. That was not the kind of man required in production engineering to-day. The only kind of man for whom the industry had any use was the man who said " it is very difficult, it may be impossible, but I will do my utmost to see that it gets through."

The President had raised an interesting point in his Address upon which he would like to touch for a few minutes. The phrase that " the old country was done up " had become rather too popular, and the President had sounded a very valiant note when he said we could do most things in this country as well as they could be done anywhere, and that there was never a small tool or measuring instrument, never a machine tool built, no matter of what type, in any works on the Continent of Europe or in America, that could not to-day be produced just as well and just as cheaply in our home factories. Of course, it would be appreciated that the President was likely to be prejudiced in his view, but really he had a right to be prejudiced because he had had a long experience. Personally, he had no doubt that, given equal opportunity, the production engineers in this country could do as well as, or better than, the production engineers of any other country whatsoever. The great trouble, as Mr. Scaife had mentioned, was that

production engineers in this country did not always have the opportunity. In too many cases our people were attempting to grow grapes on thistles and plums on pear trees, and that was beyond the wit of man. If, however, our engineers, speaking metaphorically, could only get the vine and the plum tree, he was sure the British production engineer would be able to show the world the kind of fruit that can be grown on each of these trees.

Mr. Scaife had also alluded to the question of wages and the incidence of wages on the position of the country to-day as a producing nation. He believed it would be agreed by every thinking man that the question of wages, as a sum total, was not the trouble with our country to-day, because it was possible to point to many countries in which the wages were as high as, or even higher than, those paid in this country. The essential trouble was that the rate of wages paid in this country was very much higher than it should be competitively; the amount paid for a unit of work was very much higher than it should be. It was not the actual wages that mattered. There was no thinking man who desired to tie down the man who actually produced the goods to a low wage or to a lower wage than he gets to-day, but a lower rate of wage was required. In other words, the same wage for a rather greater amount of work was absolutely essential if this country was to come out on top and keep the position it had held for the last 150 years.

Finally, he would like to stress the question of inspection, which the President had also referred to. The value of inspection to the production engineer to-day could not be over-rated. At any rate, it would keep the average production engineer from having a much too high opinion of himself (laughter), especially if he remembered that the men who had to check and criticise his work were, like himself, fallible and human. In conclusion, Mr. Pate expressed the thanks of the guests for a really delightful evening, and he again wished the Institution a useful and successful session.

Mr. A. Butler, proposing the last toast, of "The President," said the fact that the Institution had elected Mr. Hutchinson as the new President was a good indication of what those on the Council thought of him. Indeed, the Council believed that under Mr. Hutchinson the Institution was going to have a most successful year. At the same time he would like to point out to the general body of members that the office of President of the Institution at the present time was by no means a soft job, because there was a great deal of uphill work to be done in keeping a young Institution like this going. In that connection the late Mr. Max Lawrence and Mr. Fisher had both done exceedingly valuable work, and it would be no easy task to keep up the reputation that the Institution had already obtained for itself. Therefore, if they were to make progress they must not expect to rely on the

President and Council alone. They both required the strong support of the members, who should do everything in their power to bring their friends to the meetings, and if possible to induce them to join. If the meetings could not be made sufficiently interesting to attract large attendances, then it would seem that the Institution was not fulfilling the objects with which it had set out.

So far as this session was concerned, a number of new ideas were being incorporated in the meetings which would probably make them more interesting; although there was always quite as much to talk about at an ordinary meeting as there was at a dinner, we do not often get such a good attendance. The fact that the membership was steadily growing was very satisfactory to the Council, and, as he had previously mentioned, it was better that there should be a steady growth. Reference had been made to the fact that production engineers did not always take advantage of their opportunities, and he was afraid there was a good deal of truth in it. For instance, if they did not attend meetings of the Institution they were missing opportunities of gathering new information. The Council welcomed anyone interested in production engineering to the meetings of the Institution, and it was open for anyone to speak as he pleased, so long as his remarks had some relation to the subject of the paper that had been read. The class of paper and discussion depended absolutely upon the members, and if they would only come along with interesting subjects for discussion then the Council would feel that the members generally were giving them the support they were looking for. The President, in his Address, had referred to inspection. He himself could say a lot on that subject, but would reserve it because he was down to read a paper on it during the session. That, however, was only one subject, and there were many others equally interesting. If the members would only rally to the support of the Council and President there was not the slightest doubt as to the success of the coming session, and the future of the Institution.

The toast was enthusiastically received.

The President's reply to the toast will be printed in the December issue.

As the result of the ballot taken on November 5th, Mr. Frank P. Southwell, of Vauxhall Motors, Ltd., has been elected a Member of Council of the Institution of Production Engineers by a large majority.

CORRESPONDENCE.

The Institution as a body does not necessarily identify itself with the views of members expressed under this heading, nor can responsibility be accepted by the Institution for statements made by individual members. The Editor reserves the right to omit any portion of a letter if it is considered desirable to do so.

The Production Engineer in Industry.

The daily cry about the black outlook in industry is steadily maintained in the Press, and the Government are being chastised in the blackest of ink for their lack of policy in this regard. Not that this is unusual in any way; it seems the easiest way of escaping the responsibility of doing something. Statistics are given weekly showing the number of registered unemployed, and relief schemes are put in hand which give work to labourers, but the fact that the workshop must be set going to avoid the loss of our skilled workers is often lost sight of. The unemployed technical man receives no consideration at all, yet it is these men, of all others, who can increase production and reduce costs to a figure which will encourage sales.

As in the case of housing, so it is in the provision of work or dole, the working man finds plenty of spokesmen from the Peerage downwards, but the "Backbone of the Constitution" has few to recognise his existence, unless or until there is a bill to foot. His part is to pay for the various schemes, efficient or otherwise, Governmental or by local bodies, as may be decided upon.

An examination into the class who are the "Third Party in Industry"—the technical, advisory, and higher clerical grades—shows an inequality of treatment as compared with labour, which is nothing to be proud of. Any relief they may obtain during bouts of unemployment is the result of their own effort, apart from the contributory funds which a few firms have started.

It has been stated that this class has been taxed out of existence—an apparent exaggeration, because it is still live enough to suffer considerably from the disease of impecuniosity from which it is supposed to have died. In better times the patient was financially robust enough to carry on through short periods of no work, due to his thriftiness, but after years of annihilating taxation, bad trade, and increased cost of living, his financial reserve has gone, leaving him unable to stand against the buffets of adversity.

To this class, then, the re-establishment of industry on a firm foundation is an absolute necessity. Who is to take the next step?

As a man who is visiting all kinds of industrial firms, and who is astounded at the lack of efficient management in many of them, the author of this grouse would suggest that the Institution of Production Engineers has herein a plain duty that it cannot neglect. The discussion of technical papers is but one of the functions of a specialised—in this case perhaps too specialised—Institution, but such a body must come into the open and do all

that it can towards the betterment of the part of economic life to which our members sell their brains. If it will do this, the return is certain in increased membership and a higher respect and position among the important bodies of which the Institution is at the moment but a junior member.

There are good production men and organisers out of work and in less useful positions in other professions. One meets men and hears of cases where able engineers are leaving manufacturing, perhaps to its detriment, while it is well known that there are others of poor efficiency and insufficient technical knowledge who hold their jobs by reasons of birth and influence to the detriment of the firms they control. In other cases the manager is inadequately supported by technical staff, and is not allowed to obtain the specialised knowledge which can be given by the consultant; admittedly there are consultants and consultants, but good men often cannot find enough work to keep them in business.

The Institution should proceed at once to work as follows:—

1. Open its membership to all the higher grades in production, whether engineers or not.
2. Establish definite qualifications for the various grades and occupations.
3. Insist at all times on a technical man for a technical job.
4. Compile a list of qualified consultants, and get them into their organisation.
5. Discipline their own members, as does the British Medical Association.

The author does not suggest that the last move is required at the moment, but it may be necessary as the membership increases.

Other bodies are discussing the registration of the engineer, and a Bill may soon be presented to Parliament to place engineers and architects on the same footing as doctors and accountants. Is the I.P.E. to take no part in this work? One hopes that they will.

N. GERARD SMITH (Member).

The Standardisation of Shop Equipment.

One direction in which there is great scope for furthering the objects of the Institution and performing a general service is by the standardisation of all the essential and numerous details which are used continuously on jigs and tools and machine tool equipment. At the present time the majority of firms are producing their own drill bushes, clamping levers, locating pegs, jig feet, etc., as they are required, in small numbers, whereas it should not be a difficult matter to introduce standards for all such items. They could then be produced in quantities sufficiently large to enable the various details to be catalogued and purchased cheaply in the same way as nuts and bolts.

From the writer's own experience, the number of firms employing their own standards intermingled with unofficial standards published in text-books form such a large and confusing list that it is impossible for any one firm to market such everyday necessities in a generally acceptable form. Year after year firms go on producing these articles in small numbers at great cost in their own tool rooms. Would it not be possible for our Institution to elect a committee to enquire into and draw up a list of all those parts which could be standardised, and publish such lists in the Journal from time to time, besides putting them on the market in suitable form? If some such scheme could be carried out, the Institution would be performing a very practical public service which would undoubtedly be appreciated by the industry generally.

J. W. BROADBENT (Associate Member).

SCIENTIFIC MANAGEMENT.

THAT the question of scientific management is daily arousing increasing interest is evident from the Second International Congress of Scientific Management, which was held in Brussels in October. The Congress was held under the Honorary Presidency of H.M. the King of Belgium, and was attended by distinguished delegates from Industrial Groups, Scientific Associations, and Universities throughout Europe. The attention of the Congress was directed to the problem of restoring the balance between income and expenditure, by cost reductions based on the scientific utilisation of capital, raw material, and labour.

In view of the misconception which exists regarding the subject of scientific management, it is encouraging to find a body of able men endeavouring to disentangle the sound, practical issues from the profusion of theoretical arguments in which they have become involved. In fact, the theoretical aspect has been so much overdone as almost to bring discredit upon the whole science. Moreover, it is quite obvious that some people regard scientific management as a cure-all for every kind of industrial trouble. If miraculous results in a few weeks are expected, the outcome can be nothing but disappointment and discredit all round.

Allowing for all this, however, and considering the whole question from basic principles, it is seldom that manufacturers use capital, raw material, and labour to the best advantage. In fact, owing to the enormous difficulty of preserving a balanced outlook in considering these three factors in conjunction, there are in nearly every industrial organisation unsuspected sources of waste which, even if only partially prevented, would spell the difference between success and failure. It is in discovering such leakages and in pointing out the way to their elimination that scientific management performs its true function.

Amongst the various aspects of the subject which received consideration were the general problems of organisation, factory lay-out, planning, progress, wages systems, time and motion studies, working instructions, etc. The supply of raw materials was considered separately, such matters as the buying, storing, stock-taking, and checking the use of new materials being dealt with. Another session was devoted to cost control, in which accountancy as related to the control of production was considered as distinguished from ordinary industrial and general bookkeeping methods. Sales organisation received treatment at another session, and selling campaigns, advertising, and new markets were dealt with, in addition to such matters as the fixing of selling prices and the management of general stores. Another session was devoted to office organisation, and still another to the application of scientific management to State services.

TO OUR MEMBERS.

A Message from the President and Council of the Institution to all the Members of the Institution.

THE Institution has now been established over four years, and we have every reason to congratulate ourselves on the success we have obtained in such a short period, when we consider the troubles that our industry has passed through during that time.

It would seem, however, that the time has now arrived when we can expect to receive the suggestions of members as to how the Institution can be made more useful or can better fulfil the objects we have in view.

A small Sub-Committee of the Council has now been appointed for the purpose of developing the Institution, arranging papers, works visits, meetings, etc. This Committee would welcome any suggestion from members which would in any way or at any time promote the interests of the Institution or its members.

The programme of papers arranged for the present session is given on another page, and whilst the list is complete for this session, the Committee would at all times be glad to hear from anyone willing to give a paper or suggestions regarding the subjects of future papers or suitable authors. It should be borne in mind that the primary object of papers is to promote discussion, and, this being so, they need only be of short duration.

If the time and place of the meetings or the days on which they are held are not in accordance with the general desire of the members, it is more beneficial to let us know than to stay away. The Institution is for the benefit of all members, and it is the wish of the Council that it shall be a real live body of practical people connected with the production side of engineering.

Any suggestion that may occur to you to help in furthering the objects for which we set out should be forwarded to the Hon Secretary without delay. Members are also invited to take advantage of the columns of this journal to discuss matters which are of mutual interest.

The next meeting is to be held on Friday, November 27th, when Mr. E. W. Hancock will read a paper on "Jig and Tool Design." We confidently hope that all who are within a reasonable distance of London will make a special effort, not only to attend this meeting, but to take part in the discussion which will follow the reading of the paper.

R. H. HUTCHINSON, *President.*

SYLLABUS FOR SESSION 1925–26.

THE programme of papers which have been arranged for the present session is given below, and the exact time and place of the General Meetings will be announced from time to time.

1925.
NOVEMBER 27TH.—"Jigs and Tools," E. W. Hancock.
DECEMBER 16TH.—"Non-Ferrous Metals," Mr. Mundy.

1926.
JANUARY 22ND.—"Features of Machine Tools that Make for Increased Production," G. W. Rawlings.
FEBRUARY 26TH.—Mr. Hutchinson to introduce a debate.
MARCH 24TH.—"System," J. T. Kenworthy.
APRIL 21ST.—"Inspection Methods," A. Butler.
MAY 28TH.—"Overhead Charges," to be arranged.

Members are urged to make every effort not only to attend the General Meetings, but to take part in the discussion either at the meeting or by correspondence, which will be printed in the Journal.

In addition to the General Meetings, an Official Visit to the Shipping, Engineering, and Machinery Exhibition at Olympia has been arranged for Saturday, December 5th. An invitation card will shortly be issued to members, and it is hoped that a large number will take advantage of this opportunity. Visits to well-known works will form another feature of our activities during the coming session, and altogether we may look forward to an interesting year.

COVENTRY BRANCH.

Following the Annual General Meeting on November 11th, the Coventry Branch look forward to a number of interesting meetings as follows:—

December 14th, 1925, "Jig and Tool Design," E. W. Hancock.
January 13th, 1926, "Gauging," Axel Wickman.
February 24th, 1926, "Synthetic Resin Mouldings," G. Murray-Carpenter.
March 17th, 1926, "Grinding Practice," H. A. Dean.

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